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Resuscitation of the Heart*

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Accidents leading to the sudden arrest of the heart and lungs occur in the home, in industry and elsewhere but, more particularly, cardiorespiratory arrest is a disaster which occurs infrequently in the anesthetized patient undergoing surgery. Its infrequency is counterweighed by the necessity of immediate, emergent treatment which demands that every physician coming in contact with patients in the operating room must be alert to the recognition and effective treatment of the condition.

The cessation of heart action exhibits two forms. One is cardiac standstill and the second is ventricular fibrillation, both of which are manifested by a loss of pulse and blood pressure. Associated with the loss of heart action is the disappearance of respiration, occurring before or after the cardiac difficulty. Cardiac standstill is the loss of all contractile power of the musculature of the heart and no movement is discernible. Ventricular fibrillation is an incoordinate type of contraction of the musculature of the heart where constant movement is seen, but no propulsion of blood occurs. Palpation of the fibrillating heart has been described as the feel of a bag of worms. Just as each worm moves separately from the rest, so each bundle of muscle fibers in the heart loses its coordination with the remainder and contracts separately and disjointedly, with no respect for timing of its contraction.

Etiologically, two factors are generally implicated, although there is no hypothesis which satisfactorily explains the occurrence of either cardiac standstill or ventricular fibrillation. One factor of possible significance is a state of oxygen deficiency in the tissuess of the body, or hypoxia.[1] Many causes of hypoxia may occur in the patient undergoing anesthesia—insufficient oxygen in the anesthetic gases, obstruction in the airway of the patient, or too great a depth of anesthesia. The other general cause is thought to be vagal reflex inhibition.[2] Vagal stimulation is presumably responsible for cardiac arrest in operations involving the lung, hilum, mediastinum, or great vessels in the thorax. Whether vagal reflex inhibition per se will produce cardiac arrest without the presence of hypoxia is open to question.[3]

Pathologically, the changes in the body are the result of anoxia, when cardiorespiratory arrest deprives the cells of oxygenated blood. The different tissues vary in their ability to withstand periods of anoxia, the brain cells having the least ability of all. The most sensitive portions of the brain apparently do not tolerate more than 5 to 6 minutes of anoxia without damage—the motor and visual areas being the most easily damaged.[4] The recorded cases of cardiorespiratory arrest support an anoxic time limit of about 3 to 5 minutes, beyond which neurological dysfunction or death will occur. If severe, the damage to the cerebral cortex may result in death of the individual in a few hours to a few days. If less severe, the patient may survive indefinitely in various stages of vegetation. If the cortical damage is mild to moderate, the patient will demonstrate varying degrees of neurological difficulty, such as blindness, deafness, speech defects, personality changes, etc. If cardiorespiratory arrest is promptly and effectively treated, no change from the preoperative status will be seen. Pathological changes in other organs are of less significance, except for the heart itself, where prolonged anoxia may result in death of the myocardial cells and resuscitation cannot be successful.

The diagnosis of cardiorespiratory arrest must be very rapidly made by simple clinical means or the time lost will be fatal. The loss of the pulse and disappearance of the blood pressure, preceded by, accompanied by, or followed by apnea establish the

*Abridgement of an address to the S. C. Heart Association, May 26, 1952.

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diagnosis. The diagnosis can be substantiated by palpation of the heart or an available great vessel or peripheral artery. If such findings are present, resuscitation must be begun immediately. Electrocardiography will demonstrate ventricular fibrillation, but does not show mechanical arrest of the heart due to the fact that electrical activity of the heart continues after arrest, often remarkably similar to the normal.[4]

The prophylaxis of cardiorespiratory arrest is chiefly concerned with the proper anesthetic agent, skillfully given, for which there is no substitute. One of us (John A. Boone) believes that probably the incidence of cardiorespiratory arrest could be substantially reduced by the preoperative use of small doses of quinidine, given as routinely as atropine. Maintenance of a good airway with adequate oxygenation at all times is the greatest preventative measure during the course of anesthesia. Intravenous procaine or procaine amide (pronestyl) and the topical use of procaine into the pericardial cavity have a place in the prophylaxis of arrest. Patience and cooperation between surgeon and anesthetist, when anesthetic difficulties arise, may present the initiation of dangerous vagal reflexes. The greatest stumbling block to resuscitation has been the anesthetist who fails to recognize instantaneously the loss of pulse and blood pressure and the disappearance of respiration and report it to the surgeon promptly. The surgeon, likewise, may prohibit resuscitation because of failure to start treatment immediately due to fear, confusion, or hesitation in opening the chest.

There are two aims in the treatment of cardiorespiratory arrest. One is to deliver oxygen to the tissues until spontaneous respiration has reappeared, and the second is to provide power to circulate the oxygenated blood to the vital centers until spontaneous circulation has reappeared. Thus, artificial respiration and artificial circulation must be instituted.

Artificial respiration can be best accomplished by the insertion of an endotracheal tube and administration of 100% oxygen under positive pressure. If oxygen is not available, or not immediately available, then atmospheric air or even the exhaled air of the anesthetist will suffice. Oxygen by face mask with positive pressure is a less efficient method, to be used if an endotracheal tube is not immediately available. Automatic positive pressure machines, such as the Mautz type[5] are believed to be a more dependable method of constant respiration.

Artificial circulation is best performed by manual compression of the heart by the surgeon, which is called cardiac massage. Other methods such as mechanical stimuli to the myocardium (intracardiac injections, for example) are less reliable. Cardiac massage is started immediately if the chest is already opened. If the patient is undergoing abdominal surgery, then the diaphragm may be cut to introduce the hand into the pericardium. Massage through the diaphragm is usually not efficient and transthoracic massage is to be preferred, if necessary making a separate incision, usually in the left fourth intercostal space.[6] In young children, where passage of an endotracheal tube may be tedious and time-consuming, it may be advisable to enter the pericardium through the diaphragm to avoid entry into the pleural cavity with resultant collapse of the lung.

As soon as the surgeon's hand comes in contact with the heart, the differential diagnosis between cardiac standstill and ventricular fibrillation will be apparent. If the preferred transthoracic approach has been made, it is not necessary to lose time opening the pericardium prior to beginning massage. After a minute or two of cardiac massage, the pericardium may be opened, not only for the most efficient massage, but also to visualize the myocardium and substantiate the presence of cardiac standstill or of ventricular fibrillation. Massage will produce the highest obtainable blood pressure if it is done with the apex of the heart in the palm of the hand, with the fingers anteriorly and the thumb posteriorly placed on the myocardium. The number of compressions desirable per minute is a controversial subject[6, 7, 8] but it is probably most effective to approach 100 to 120 compressions per minute. Hands producing massage at such rates will tire rapidly, and other hands to relieve the surgeon should be requested. Intravenous or intra-arterial blood transfusions may be used to increase the circulating blood volume, using caution to prevent overloading the circulation if no particular blood loss has occurred.

If cardiac standstill is the type of arrest present, massage should be continued until spontaneous heart rhythm is resumed. If ventricular fibrillation is found, massage of the heart should be continued until preparations for defibrillation are complete. So-called serial defibrillation is at present the best method to combat fibrillation. Developed by Hooker and coworkers,[9] Wiggers,[8] Mautz[10] and Beck,[11] serial defibrillation implies the passage of a series of electric shocks through the heart from electrodes placed on its surface, converting the fibrillating muscle bundles into progressively larger groups of contracting muscle bundles with each shock, until all action ceases. After all action has stopped, spontaneous beats may be quickly regained or cardiac massage may be reinstituted until spontaneous action appears.

Drugs have long been used as cardiac stimulants. Adrenalin has had the widest use and cases have been reported where adrenalin restored the heart beat. It is thought, however, that adrenalin may increase cardiac irritability to the point of initiating ventricular fibrillation and it should not be used if ventricular fibrillation is the type of cardiac difficulty present. Adrenalin probably serves best in increasing weak cardiac action or in helping to initiate cardiac action in cases of standstill where no response to massage has been achieved. Calcium chloride has been reported by Kay and Blalock[12] as helpful in restoring heart action. Procaine and procaine amide (pronestyl)

have been used to depress myocardial irritability from hypoxia and cardiac massage, using them either as a drip onto the epicardial surface or for intracardiac injection. Barium chloride and potassium chloride have been suggested also for their depressant effect. Coramine, metrazol, alphalobeline, picrotoxin, and other convulsant drugs are condemned by Dale[13] because these drugs usually fail to stimulate respiration and cause an increase in cerebral metabolism.

Here at the Medical College an increasing number of cardiac, great vessel and thoracic operations are being performed, in addition to an increasing number of radical operations elsewhere on the body for cancer, et cetera. The increase in these types of surgery has made it mandatory that we formulate a planned procedure of action if and when cardiorespiratory arrest occurs. Practice in a plan of action must be gained so that members of the team can proceed with treatment promptly and effectively.

To gain experience in resuscitating the arrested heart and to practice and evaluate the best methods of restoring heart action, an experiment on animals has been devised. It is extremely difficult to produce cardiac standstill consistently in dogs, and it is believed that arrest from ventricular fibrillation is more difficult of the two types of arrest to treat successfully. Therefore, it was elected to produce ventricular fibrillation as a means of studying cardiorespiratory arrest. It is well known that an electrical charge up to 70 volts passing through the heart will initiate fibrillation. Similarly, it has been established that an electrical charge above 90 volts applied to the heart will cause fibrillation to cease.

The experiment is hinged upon a defibrillator made by one of us (John A. Boone).[14] The defibrillator is adjusted to deliver up to 130 volts in either 0.1 or 0.5 second, controlled by a light-flash in order to visualize proper function of the apparatus. The power inlet cord is connected to the standard 110 volt house outlet, and a small transformer builds up the current to 130 volts and isolates the output from the power line. The power outlet cord connects with the electrodes which are brass discs, 5 cm. in diameter. The discs are held by plastic handles to protect the surgeon, and the isolation transformer in the apparatus further protects the surgeon from receiving a shock himself. It would be necessary for the surgeon to hold both discs in his unprotected hand during a shock to receive an electrical charge to his own body. The defibrillator is inexpensive and has functioned for a year without any repairs being necessary.

It was suggested (John A. Boone) that passage of 130 volts through the external surface of the animal's chest would result in approximately 20% of the electrical charge passing through the heart itself, or about 26 volts, sufficient to initiate fibrillation. This has proved to be successful, using one 0.5 second shock. Occasionally, a second or third such shock has been necessary, but never more than 3. If the electrodes are then placed on the surface of the myocardium itself and a 130 volt shock is passed through the heart, defibrillation ensues. The same adjustment of the apparatus for fibrillation and defibrillation greatly simplifies the procedure.

The experiment is conducted in the following manner. An animal anesthetized with intravenous nembutal is placed on the operating table and electrodes for continuous electrocardiographic tracings are placed upon the four extremities. An endotracheal tube is placed in the trachea and connected to a resuscitator machine delivering 100% oxygen continuously recorded electromanometrically. The chest is opened and the pericardium is incised to permit the hand to grasp the heart itself for the most effective massage. The electrodes are then placed upon the external surface of the animal and a 0.5 second shock is produced, followed regularly by ventricular fibrillation. Cardiac massage is then begun after a brief interval to allow electrocardiographic verification and recording of the fibrillation. The blood pressure, which falls to 0/0 with fibrillation, rises from 75/35 to 130/60, on the average, with effective massage of the heart. Massage is continued with the heart fibrillating for a standard period of time. The electrodes are then placed on the ventricles and a standard series of shocks are passed through the heart to effect serial defibrillation. If defibrillation is not successful, the heart is massaged again for a standard period of time and serial defibrillation again attempted. When defibrillation has occurred, the heart is watched for a period of time to determine if standstill or fibrillation will occur; the chest is then closed.

After an initial set of experiments was done to prove the efficiency of the defibrillating apparatus, and to standardize the technique, it was decided to begin a series of experiments to evaluate all procedures and drugs suggested as aids in resuscitating the arrested heart. This work is continuing and this report is preliminary in nature. Thus far, 20 dogs have been subjected to ventricular fibrillation and then after a standard period of cardiac massage, defibrillated. The first set of 10 dogs were simply fibrillated, massaged and defibrillated without benefit of any other procedure, to serve as a baseline for subsequent experiments. These dogs required no more than three 0.5 second shocks to fibrillate them. After the period of cardiac massage, a series of shocks, varying from one 0.1 second shock (in two dogs) to forty-nine 0.1 and 0.5 second shocks (in one dog), were used to defibrillate the hearts, giving credence to the belief that the canine heart is more difficult to defibrillate than the human heart. Five of these dogs died from 1 day to 2 months after successful defibrillation, three of the 5 dying within 4 days postoperation. These three dogs received a large series of shocks in order to defibrillate them, and it is believed that if more than 15 shocks are necessary, uniform mortality can probably be expected. One of the 5 dogs who died showed mural thrombi with pulmonary embolism at 9 days

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after defibrillation. The remaining one of the 5 died 2 months postoperatively from congestive heart failure. Autopsy showed extensive myocardial hemorrhage in those who died within 10 days of defibrillation if extensive shocks were used. The remainder of the animals in the first 10 were sacrificed at 3 months or longer and their hearts demonstrated varying degrees of myocardial and epicardial scarring at the site of the placement of the electrodes.

The second set of 10 dogs thus far studied were likewise fibrillated, massaged and defibrillated in the standard manner, but in addition, were given intracardiac injections of quinidine in doses of 5 mgm. per kilogram of body weight before cardiac massage was begun. No animal was defibrillated by the needle puncture of the heart. After cardiac massage, a series of shocks were passed through the heart. In contrast to the first group, the number of shocks varied from one 0.1 second shock to six 0.1 second shocks—no 0.5 second shocks were necessary. Again in contrast to the 50% mortality of the first group, all 10 of the dogs given quinidine are alive, eight of the ten living 2 months after defibrillation. The other 2 dogs were fibrillated too recently to evaluate.

Experiments are being conducted to evaluate the ability of quinidine to protect the individual against fibrillation, quantitatively measured as to the number of shocks necessary for fibrillation. Studies to evaluate procaine, procaine amide, aranthol and other suggested procedures are planned.

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Utilization of Circulating Blood Volume Determinations in Surgical Patients*

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The laboratory procedures most frequently used, namely, hemoglobin, plasma protein concentration, red blood count, and hematocrit determinations, do not always correctly evaluate the degree of deficits or excesses of the circulating blood volume in surgical patients. This has been brought out by numerous investigations and is particularly evident in patients who have been ill for a considerable length of time prior to surgery.

We have recently reviewed the methods of determining the total circulating blood volume[1] and plasma volume used by various workers. Among those most commonly reported are estimations by means of the azo dye, T-1824, tagging of red blood cells with carbon monoxide or methemoglobin, and by injection of red cells treated with radio-active iron or phosphorus into the circulation.

In this study, the method which was felt to be accurate within an acceptable degree of error, economical, and not so technical as to decrease the ease of determining total circulating blood volume in the average institution, was selected. Evan's blue dye (T-1824) was used in this investigation, the procedure simulating that of Beling and co-workers.[2]

Estimations were based upon the degree of concentration of the dye in the plasma following injection. From the determination of total plasma volume, the total blood volume, protein, hemoglobin, and red cell volume could be calculated. Multiple determinations in individual patients were done, and

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it was concluded that an error in determinations of approximately 10 percent (including a 5 percent experimental error) was present.

The steps in this procedure are briefly summarized as follows:

1. The withdrawal of 15-20 cc. of the patient's blood to be used for control was first performed.
2. This was followed by immediate injection of 5.2 cc. of the dye into the blood stream.
3. 15-20 cc. of dyed blood were withdrawn 10 minutes later.
4. The blood samples were next centrifuged.
5. Determination of hemoglobin concentration, hematocrit, and erythrocyte count was done while centrifugation was completed.
6. Plasma protein concentration and specific gravity were then determined.
7. Determination of the optic densities of the control and dyed plasma by means of a spectrophotometer was accomplished.
8. Calculation of the various elements comprising the circulating blood volume from established formulae was then completed.

The entire procedure, including numerical calculations, took an average of 45 minutes in our study. This time could have been reduced approximately one-third were comptometers used for calculation. The laboratory personnel also easily mastered the steps as outlined above, and results were entirely satisfactory.

In this study, control of hypervolemia due to excessive transfusions, pre-operative replenishment to standard blood volume without hemoconcentration, and control of hypoproteinemia, were accomplished.

An additional guide is the degree of weight loss. The patient's present weight is subtracted from the optimum weight in health of the patient prior to illness. This enables a more accurate estimation of deficits, especially in individuals who have been chronically ill for long periods of time.

As a result of our experimentation which involved approximately 75 determinations of the circulating blood volume, it was again brought out that the use of hemoglobin determinations, plasma protein concentration tests, and red blood counts in the estimation of the clinical status of the surgical patient often give an erroneous impression of their circulating blood volume. By means of circulating blood volume determinations, on the other hand, we have been able to adequately control the clinical course of these patients.

Since, in many instances, the facilities are not available for determination of circulating blood volume, what can be learned from these studies that would be of help under those circumstances?

Actually the clinical evaluation of the patient by history and physical examination gives a better idea of the status of the patient and the requirements for replacement than does the usual laboratory procedures. When the patient has lost considerable weight especially with dehydration, it may be safely assumed that the circulating blood volume is low. Dehydration should be corrected and an attempt made to bring the blood volume to normal before surgery. The restoration of the blood volume depends on adequate administration of whole blood and in some instances plasma. The degree of weight loss in conjunction with the other findings is a fairly reliable index of the amount of blood needed.

SUMMARY

The determination of circulating blood volume has proved to be the most reliable index of the true status of the patient. A review of cases in which 75 determinations of the circulating blood volume were made, confirmed the fact that the usual laboratory studies do not give a correct estimation of the clinical status of the patient. As a rough index, when circulating blood volume determinations are not available, the degree of weight loss in conjunction with the history and physical examination gives the best estimation of the amount of replacement necessary.

At the present time, there is no laboratory procedure readily available for determination of interstitial fluid volume. This must be estimated clinically and with the response of the circulating blood volume to replacement therapy.

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Relation of Enrichment and Sanitation of Corn Meal to Health*

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(One of the main factors in the development of good nutrition is the intake of an adequate amount of basic foods. These basic foods, such as wheat, rice and staple grains, must be of good quality to be effective. The Nutrition Department of Clemson College has been one of the pioneers in promoting the enrichment of basic foods to meet standards of adequacy and we are pleased to present this report of work which has been done in this field. This work might not seem to be of a medical nature and yet it is of vital concern to the practicing physician since it describes the foundation stone upon which efforts are made to promote healthy bodies. — Editor.)

Since prehistoric times man has depended upon grain products for staple foods. It is thought that the ease with which grain is preserved and the necessity for the cultivation of grain have helped to transform nomadic peoples into stationary peoples who began to build their cultures with the settling down. The greater part of the world's population uses either wheat or rice as staple grains.[1] However, those living in the temperate zone depend to a great extent upon corn, barley, and rye for their main grain supply. This appears to be true especially in the underprivileged groups of such countries.

Corn is significant as a food crop in several areas of the world, among those being Mexico, Central America, certain countries of South America, Egypt, and South Africa, parts of Italy, and the Balkan states. The economically underprivileged use corn in large quantities as a human food. The poorer, more remote, more agrarian sections of a country consume grains as food, while in the more advanced, richer sections grains are used more as a feed for livestock to furnish supplementary animal foods. It is not economical of calories and protein to feed grain to livestock since three to ten pounds of grain is required to produce one pound of meat or other animal products. Thus, when the food margin for survival is low, the people tend to eat the grain rather than feed it to livestock. Along with high grain consumption certain nutritional deficiencies are found, i. e., in the rice-eating populations, beri-beri; in the corn-eating populations, pellagra.

Despite efforts toward nutrition education, despite the prevalence of vitamins sold over drug store counters, despite increased income, even in the United States, there are certain groups who will not or cannot improve their nutritional status. It is to these groups that cereal enrichment in the United States should be of most benefit. Nutritionists have long realized that the nutritional value of the corn meal and grits consumed in the South should be improved. The consumption of large amounts of corn products may result in pellagra, unless the diet is rich in other sources of niacin. The niacin content of corn is low compared with that of other grains, and the proteins of corn are especially deficient in the amino acid tryptophan. In the absence of this amino acid and with a low intake of niacin, pellagra quickly develops.

The movement for the enrichment of corn meal had its beginning in the United States on October 1, 1941. The foundation was laid by the Food and Nutrition Board of the National Research Council with the resolution, "That at present the committee favors appropriate enrichment of flour and bread, (and perhaps corn meal). . ."[2] Corn products at this time were given a minor and parenthetical place in the resolution because human consumption of corn products in large quantities is confined, in the United States, to the southern region. It was logical therefore that a southern state should be the leader in arousing interest in corn meal enrichment. The South Carolina State Nutrition Committee faced squarely the fact that fixed food habits and low incomes would be major factors in preventing changes in family diets. It was believed feasible and practical, however, to make significant improvement in nutritional status by enrichment.[3]

Enrichment Mixtures and Enrichment Equipment

Whole corn meal has none of the vitamins and minerals removed in the grinding process, but corn is notably below whole wheat in vitamin and mineral values. Grits and degerminated corn meal, like white flour, have undergone a refining process which removes most of the vitamins and minerals. It was deemed desirable, therefore, to enrich corn products so that the vitamin and mineral content would approximate that of whole wheat and enriched wheat products. Results of surveys made by Experiment Station and Extension Service workers to determine common cooking practices showed that a large percentage of the housewives habitually washed grits before cooking. A mixture was developed for grits enrichment which would not wash out during the rinsing process, yet would dissolve during the cooking process. Two ounces of this premix are mixed with 100 pounds of ordinary grits to give the desired vitamin and mineral potency.[4] For the enrichment of corn meal one need only mix a uniform amount of powdered enrichment mixture with the corn meal which, like wheat flour, is not subjected to washing before cooking.

*Technical Contribution No. 213—South Carolina Agricultural Experiment Station, Clemson, South Carolina.

TABLE I

ENRICHMENT OF WHOLE AND DEGERMINATED CORN MEAL

Figures represent milligrams per pound

		Degermed Corn Meal		*Whole Corn Meal*	
	Enrichment standard minimum	Naturally present in grain	Necessary to be added*	Naturally present in grain	Necessary to be added*
Thiamine	2.0	0.2	1.8	1.6	0.4
Niacin	16.0	2.0	14.0	4.0	12.0
Iron	13.0	2.0	11.0	5.0	8.0
Riboflavin	1.2	0.2	1.0	0.4	0.8
Calcium	500.	40.	460.	50.	450.

*In actual practice millers add more than these amounts to allow for fluctuations and to provide a margin of safety. Premixes are so compounded that more than the minimum amounts of vitamins are added when used according to directions. Corn meal may or may not be enriched for shipment across state lines; either product is legitimate under Federal law, but if labeled "enriched" the meal must conform to Federal standards. Within the borders of those states which have corn enrichment laws, sale of the unenriched product is illegal.

In the milling of corn meal the shelled corn is run through buhrstones or corrugated steel rolls. Some "top runner rock mills" have been in operation for a century; frequently they are located where there are productive farms and ample water power. Some areas prefer very coarse meal, others a medium granulation, and others a meal so fine that it is essentially corn flour. The South Carolina Experiment Station developed an attachment, called an enrichment feeder, for feeding a small stream of enrichment premix into the corn meal or grits at a uniform rate. This attachment was designed specifically for small mills, but many larger corn mills use essentially the same type of feeder. The enrichment equipment most commonly used consists of a small feeder driven by a round or V-type belt. It contains an impeller which rotates past an adjustable opening where the material is discharged by agitation and the outward sweep of the impeller blades. Millers often install their own enrichment feeders after ordering them from Clemson College. To encourage the program both the enrichment equipment and mixture are made and distributed on a non-profit basis. Prior to February 1, 1953, Clemson College compounded and distributed a total of 150 tons of enrichment mixture to small mills in the South. This non-profit service made a material contribution toward combating dietary diseases. Two ounces of the Clemson enrichment mixture are added to each bushel of whole corn meal as it is being milled. This adds to the vitamin and mineral content the amounts shown in Table I.

Educational and Legislative Programs

The educational program to get consumers to ask for enriched corn meal and millers to begin enrichment could best be done by the Agricultural Extension Service. Substantial financial aid in this work was provided by the Williams-Waterman Fund for Combat of Dietary Diseases, Research Corporation, New York City.[5] Schools, county and home agents, public health workers, and others included improvement of corn meal in their regular teaching program. The South Carolina Experiment Station produced and distributed the enrichment equipment and mixture on a non-profit basis. Specialists of the Agricultural Extension Service undertook to persuade the millers to buy the equipment and mixture. The educated and more progressive citizens among the millers offered no objection to enrichment of corn meal, although many asked questions. The farm and home agents of the Extension Service talked to the leaders in their communities at meetings for general agricultural purposes about the value of enrichment of corn meal. If the miller decided he wanted to begin enrichment, a sketch was made of his mill and specifications for the type of enrichment equipment were listed. A few days later a light panel truck driven by an experienced mechanic operating from the Extension Service headquarters stopped at the corn mill. The mechanic helped the corn miller install the enrichment equipment and familiarized the miller with the workings of the enrichment feeder which automatically fed a small, adjustable stream of the enrichment mixture into the corn meal as it was being ground. The miller paid $24.00 for the equipment and also purchased some of the enrichment mixture which was compounded at Clemson College and distributed on a non-profit basis. The cost of enough enrichment mixture to enrich 100 pounds of corn meal was only 6 cents.

Simultaneous with the installation of enrichment feeders in a county, a publicity program was conducted which brought to the attention of the majority of residents the fact that the mills were beginning to put the vitamins and minerals into corn meal. This was done by articles in the newspapers, by radio talks, and by distribution of Clemson publications[6,7,8] at corn mills. Exhibits were shown at county fairs and other large meetings (Figure I). A motion picture, "Making a Good Food Better," was made at Clemson College to depict corn enrichment in its proper place in the general nutrition program. It is a 16 mm. sound, color film having a running time of 12 minutes.

In 1943 the South Carolina State Nutrition Committee recommended that the State enact a law requiring the enrichment of all degerminated corn meal and grits and requested small local mills that produced whole ground corn meal to enrich this product

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Figure 1. An exhibit shown by Clemson College to thousands of people at county fairs and other large meetings. A staff member demonstrated corn cleaning, enrichment, grading of corn, and modern storage elevators.

voluntarily. Compulsory action did not apply to whole corn meal made by small mills in the state, as it was deemed impractical to enforce it in 1943. Five southern states have laws, enacted between 1943 and 1948, requiring that all degerminated corn meal and grits sold within their borders shall be enriched. They are North Carolina, South Carolina, Alabama, Mississippi, and Georgia. Legislation requiring the enrichment of all types of corn meal intended for human consumption was viewed as a goal, with the development of satisfactory premixes and methods of blending them into whole corn meal in the little mills of the South. Education was considered most important, but it was felt that legislation would help to make corn meal enrichment a permanent contribution to public health. When the educational program had progressed and the majority of the better local mills were voluntarily enriching corn meal, the South Carolina State Nutrition Committee was ready to sponsor legislative action.

During the five years which had elapsed, a feeling developed that a law requiring enrichment of whole ground corn foods would be beneficial to progressive millers as well as to consumers. The enrichment law then existing, requiring only the enrichment of the degerminated corn products, was broadened in 1949 to cover all corn products for use as human food.[9] Enrichment of whole corn meal is now becoming a routine milling operation, and its cost of about 6 cents per 100 pounds is considered a fixed production expense of all mills.

While this movement began in South Carolina, it has been extended into other southern states by essentially the same means. Alabama, Georgia, Mississippi,[10] and North Carolina have made great progress along this line, and similar programs are being contemplated elsewhere. Upon request Clemson College is providing equipment and enrichment mixture at cost to other states. Associated with teaching the value of enrichment in the broad general nutrition approach to consumers is a program to encourage corn millers to improve the sanitation, storage, milling, and merchandising of corn meal.

Contamination of Corn Meal

Most people do not realize that insects and rodents are not easily kept out of corn in warm climates. The fact that these pests eat out the embryo of the corn kernel, as well as contaminate it, is worthy of consideration in attempts to improve quality. Fortunately, better roads and trucks make it practical to haul corn longer distances to centers where modern storage and milling facilities can be profitably operated in the production of better food. Corn milling is thereby being modernized, and many small mills are discontinuing operation.

The Federal Food and Drug Administration has for the past several years been trying to get corn millers throughout the nation to produce clean meal and grits for shipment across state lines. Since only inter-

state shipments are subjected to federal regulations, there has been little concern among the small corn mills within the state to produce meal that is free from rat excreta.

The effects on public health of a food supply such as corn meal which contains rat excreta and from 2000 to 5000 insect fragments per pound are not known. In fact, it is questionable if one should attempt to state or determine what the effects on human health might be from ingestion of insect fragments and rodent excreta. The Federal Food and Drug Administration does not try to defend a position that insect fragments and rodent excreta are injurious to health, but rather that a product containing them is adulterated and misbranded. If a contaminated corn meal bag were labeled "contains rodent excreta, hairs, and insect fragments," it would not be misbranded, but of course, no dealer would try to sell it. Obviously, rat excreta and excessive insect contamination should not be found in corn meal offered for sale on South Carolina retail shelves. The South Carolina Experiment Station purchased bags of corn meal from retail stores at random across the state and found the high percentage of contamination shown in Table II. In the analysis of a true aliquot of the sample, the method used by the Federal Food and Drug Administration[11] was used. In this procedure 45.4 grams of corn meal was put through the immiscible solvent flotation process, whereby the heavier rodent excreta particles sank to the bottom and the insect fragments were floated. After several re-floating steps in the technical procedure, the particles were filtered from the fluid and examined under a microscope by a trained technologist whose procedure was checked on two occasions by federal laboratory technicians.

TABLE II
ANALYSES OF 208 SAMPLES OF CORN MEAL

	Percentage of samples found to contain rodent excreta particles and hairs	Number of insect fragments per pound of meal
Oct.-Nov.-Dec. 1950	27.6	2,917
Jan.-Feb.-Mar. 1951	41.4	2,511
Apr.-May-June 1951	48.8	2,597
July-Aug.-Sept. 1951	38.5	5,315
Oct.-Nov.-Dec. 1951	54.2	5,068
Jan.-Feb.-Mar. 1952	38.6	2,480
Average	41.5	3,481

The Experiment Station and Extension Service have been carrying on an educational program aimed at securing better corn for human food than is fed to stock. However, the program has made little headway because it is common practice for millers to buy corn from farm cribs throughout the year and grind it into meal and feed. Corn intended for human food should be harvested early, dried to 12 per cent moisture, cleaned, stored in a silo-type elevator, and fumigated. Under these conditions South Carolina corn makes excellent meal.

Clemson College designed a machine to screen the dirt from shelled corn before it is ground into meal. Exhibitions, demonstrations, and published bulletins have influenced about half of the corn mills to clean their corn to some degree.

Several other foodstuffs probably need to have minimum sanitation standards established. Education appears to be a prerequisite to this reform. If progress is to be made, several organizations will need to put food sanitation into their program of leader and consumer education.

Summary

Clemson Agricultural College compounds an enrichment mixture for whole corn meal and distributes it to small corn mills in the South. This college also designs, builds, and distributes enrichment equipment suitable for small corn mills. These services are rendered on a non-profit basis and are coordinated with the educational program in order to encourage millers to enrich their corn meal and corn grits.

Enrichment of corn meal offers an inexpensive method of eliminating pellagra and improving the diets of people in those parts of the world where corn is a staple food. In South Carolina enrichment of all types of corn meal and corn grits that are sold has been mandatory for several years.

Corn that is to be used for human consumption should be stored under better conditions than corn which is to be fed to livestock. Good storage would prevent contamination by rats and insects. Shelled corn should always be run through a cleaning machine before being ground into meal and grits.

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The Journal of the South Carolina Medical Association

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MAY, 1953

106TH YEAR

As this is being written final plans are being made for the 105th annual meeting of our Association, and when this appears in print our 106th year of existence will have begun.

Recently we were re-reading the Brief History of the South Carolina Medical Association which was written by Dr. Joseph I. Waring of Charleston in 1948, in celebration of our one hundredth anniversary. (For those who have not read this little volume, or for those who have not looked through its pages in recent years, we would recommend its perusal).

Small though our Association has been in comparison with other state medical societies, our history is one of which we may be proud. We have had some great physicians in our midst, we have made some real accomplishments. Think back to some of the men whom many of us knew in their lifetime—men who were our leaders—Robert Wilson, LeGrand Guery, S. C. Baker, J. M. McIntosh, J. W. Jervey, E. F. Parker, F. H. McLeod, H. L. Shaw, C. F. Williams, R. S. Cathcart, George Bunch, D. L. Smith, Wm. Egleston, Julius Taylor, L. M. Stokes, Douglas Jennings, J. R. DesPortes, James McLeod. Picture our Association as it was 25 years ago and compare it with what it is doing today. In line with progress which has been made over the entire country our association has kept step and is recognized today as a society which is both living and working.

Our heritage is one of which we are proud, and the lives of those who have gone and the deeds which have been accomplished are a challenge to us today. Could our first president, Dr. James Moultrie of Charleston (who served for five years in this office and who also served as vice-president of the American Medical Association) come back and see us as we are let us hope he would not be ashamed of the organization which he founded.

A FABLE

Fount Richardson, M. D.
Fayetteville, Arkansas

(With the permission of the Southern Medical Journal, we are presenting an address which was presented by Dr. Richardson as the Chairman's Address at the Section on General Practice of the last meeting of the Southern Medical Association.

This fable, like one of Aesop's fables, is written in simple language and with penetrating discrimination. It carries a truth which all of us need to be reminded of every day.

It was our privilege to be a classmate of Dr. Richardson's for four years in medical school and we can assure those who do not know him that he is a real "doctor of the old school." What he says comes from his heart and his message is written for every physician who practices medicine. Editor.)

Once upon a time there was a gentleman who lived upon a pedestal. His close friends called him "Doc." He called himself a physician. He dressed in the conservative mode of the day. He carried with him the dignity of decision. He studied his fellow man with as much scientific knowledge as he could muster and conducted his care of his suffering patients with all the study, and all the art he could command. He not only studied his patient; he studied the patient's family, his parents, and so on. Part of his treatment came from his pill bag; part of it came from his heart. He gave full measure of both. He was not too busy on a cold night to go to see a patient. He was not so engaged at the country club that he had to take Thursdays off. Though not often eloquent, he found time to attend the town meetings, to express his sound judgment on a civic or a social problem. He did not leave his charity cases to a social worker or a politician who was out of a job. Often with his fellow physicians he would plan for an equitable distribution of the charity work to be done in his community. Often one would relieve another so that time could be had for further study. These devotions he took as his duty to that stern mistress, the practice and study of medicine. He never heard of a committee on public relations. His public relations were automatic.

He found many privileges accorded him for this devotion. He was given the first place in any home he visited. He could come and go when he felt it best. His car, or carriage, was noted, and accorded the

right of way. His opinions were respected in any department, and his word in medicine was law. He was loved and praised by his clientele. His charges varied from nothing, to a proper fee, for the wealthy. He found room to live on that pedestal, and the persons he served helped to keep him there. This is the man of whom it was truly said, "He is the flower of our civilization."

Then he became a Big Doctor. He called himself a surgeon, or an otolaryngologist, or a roentgenologist, or a general practitioner. His friends dropped the Doc, for the Doctor. It became necessary for him to dress in the plus ultra fashion of some far away town, dominated by actresses, and actors, and others. He turned from the dignity of decision, to the debonair nonchalance of a cosmopolitan. He left the study of his patient entirely to the laboratory. He omitted the art of treating the family. Most of the treatment came in the cool halls of a modern hospital, from an ampule, or an instrument, from an efficient and highly impersonal nurse. None of his treatment came from the heart. He could not be disturbed at night, but the night's problems could find answers at the hospital where interns were waiting in inexperience, for that service, and experience. He could not be disturbed on Thursday afternoons, or Saturday afternoons, or all day Sunday. Some other doctor, and so forth, and so forth, and so forth.

He took no time for community problems. He left that to the politicians, and the social workers. He decided that the city, or the state, or the federal government could care for the charity cases. He even urged the government to take care of the veterans, and their families!

His late model expensive car forced its way along the thoroughfares, protected from the law by the caduceus.

But he kept all the privileges. That is, until the public found that they had trouble in getting medical care on Thursdays, and those other days, and that being shunted from the laboratory, to two or three consultants for a few minutes each, was time consuming, and very expensive; that there was not treatment from the heart of a friend. He found the public taking over the treatment of paupers, and others; and calling the rules to fit the government, instead of the science and art of medicine. He found himself forced upon a salary, subservient to the politician to whom he left the problem of the sick. He found some solace in demanding, and getting high fees.

But, he began to lose his privileges. He no longer lived on a pedestal. His acquaintances were large, his friends few. He found himself without any elevation that he had previously enjoyed. He was looked upon as greedy and rich. He lost the sight of his obligations and he lost his privileges.

MORAL

Never sell your birthright for a mess of social pottage.

INTERNSHIP MATCHING PROGRAM

On July 1 more than 6,000 new doctors from U. S. medical schools will begin internships at hospitals throughout the country. As a result of a national matching plan, now in its second year of operation, ninety-five per cent of the interns will complete their formal medical training at the hospital of their first or second choice, according to a report on the recently completed program in the April issue of The Journal of MEDICAL EDUCATION. Eighty-five per cent of the students received their first choice internship.

The national matching plan was set up last year to lessen difficulties caused primarily by the disparity between the number of internships and doctors available to fill them. The difference between the number of internships and available new doctors continued this year at about the same rate. While 6,033 students participated in the plan, some 10,971 internships were offered.

The matching plan has gained increasing support from students and hospitals since its inception last year. It was proposed in 1950, but the first participants were 1952 graduates. The plan has been found impartial and orderly, helping to relieve pressures on both students and hospitals.

The plan places no restrictions on the student as to the number of internships for which he may apply, or on hospitals for the number of internships they may offer. Both students and hospitals are free to negotiate with each other in the normal competitive American fashion, short of actually signing a contract.

Students apply directly to the hospitals, then send to the matching program headquarters in Chicago a list of the internships for which they applied, in order of preference. Hospitals do the same with applications they receive. To provide speed and accuracy, information obtained is transferred to punched cards and the actual matching is done by punched-card machines. Students are matched only to a hospital for which they have applied, and hospitals are matched only with students they have indicated they wish to accept.

Matching was successful for the 28 couples participating this year. Upon request, married and engaged couples are matched to the same hospital.

Operating under a new name, the National Intern Matching Program, Inc., the corporation is owed and controlled by the Association of American Medical Colleges, Council on Medical Education and Hospitals of the American Medical Association, American Hospital Association, American Protestant Hospital Association and the Catholic Hospital Association. The directors include student representatives. Various government services are also represented.

The new name was adopted as more definitive of the work of the organization, which is limited to the matching procedure. It was known formerly as the National Interassociation Committee on Internships.

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A. M. A. NEWS NOTES

AMA MEETING TO BE AIRED ON RADIO AND TV

Physicians who cannot attend the AMA's 102nd annual convention can see and hear highlights of the meeting via radio and television.

The presidential inaugural ceremony will be broadcast coast to coast on Wednesday, June 3. Although the inauguration of President-Elect Edward J. McCormick will be held Tuesday, the coronation of Queen Elizabeth II of England on the same day—which will be widely covered by radio and television—has made it necessary to re-broadcast the proceedings on Wednesday evening.

In television areas, the half-hour "March of Medicine" program, originating at the Scientific Exhibit in New York's Grand Central Palace, will be presented either Thursday or Friday evening. This television coverage will be sponsored by Smith, Kline and French, Philadelphia pharmaceutical firm.

Further information on these two programs will be available in the near future.

EUROPEAN MD CONTRIBUTES TO AMEF

A European-educated physician now residing in Madera, California, believes that physicians should support American medical schools. Although he owes no allegiance to any school in this country, Dr. Thomas Klein sent in a donation to the American Medical Education Foundation. His action sets an example for graduates of American medical colleges. In less than three months of this year, the Foundation has received in excess of $657,000 from more than 7,000 contributors towards its 1953 goal of two million dollars.

THERE'S NEWS IN RURAL HEALTH MEETING

Reporters were quick to spot news in a gathering of more than 600 persons at AMA's eighth national Conference on Rural Health, held Feb. 27-28 at Roanoke, Virginia. The meeting—the largest yet—drew representatives from medical and agricultural groups in 42 states and the District of Columbia.

To publicize the Conference, AMA sent packets containing 10 different releases to more than 500 newspapers, radio stations, wire services and farm publications throughout the country. Reporters assigned by Roanoke's two papers filled several columns each day with stories, photos and interviews.

Radio-TV coverage was excellent. Roanoke's three stations carried 12 interview programs plus extensive commentary on news shows. Sixty-two Virginia stations each received five tape-recorded programs on rural health as a service of Virginia's Polytechnic Institute, whose radio director taped them at the Conference. It can be estimated that more than 500 radio programs mentioning the Rural Health Conference were presented throughout the United States.

FACTBOOK ON MEDICAL EDUCATION

Current statistics on medical education in the United States have been compiled in a convenient pocket-sized booklet for handy reference to be distributed early in April by the American Medical Association. Information contained in the "Factbook on Medical Education" is based on a report made by the Council on Medical Education and Hospitals during the academic year 1951-52. Written in an easy question-and-answer style, the new booklet gives information on enrollments, financial support, faculty and new medical schools. The booklet will be distributed to state and county medical society officers, AMA delegates and officers, newspaper and magazine writers, and allied health organizations. Additional copies will be available for distribution by state and county medical societies.

AMA EXHIBITS FACE BIG YEAR

To all four corners of the country go AMA exhibits! These exhibits are displayed not only at AMA annual and clinical meetings but also at home and food shows, automobile shows, farm shows, state and county fairs, and over television. So far in 1953 there have been 130 exhibition days in seven states. Bookings now on hand total 187 days of exhibit showings in 21 states, with a total of 43 different showings already scheduled.

So popular has been the display entitled "Testing the Drinking Driver" that two copies were prepared. Last year one of these was shown 96 days before 19 different groups in nine states, while the other copy was shown 84 days before 22 groups in 11 states. All bookings are handled through the Bureau of Exhibits.

FORMER MEDICAL OFFICERS SURVEYED

In analyzing 467 questionnaires returned by former armed forces medical officers, the Council on National Emergency Medical Service has extracted pertinent data on percentage of time spent in treatment of military personnel and their dependents, staffing conditions and the number of physicians willing to remain in service.

The survey of former army, navy and air force physicians shows:

(1) *Percentage of time*: Between 44% and 54% of total overseas time was spent in treatment of military personnel and between 39% and 53% of total domestic time. Treatment of dependents took between 19% and 28% of overseas time and between 25% and 44% of domestic time.

(2) *Staffing conditions*: Overstaffing—136 replies—ranged from 15% to 44%. Understaffing—79 replies—ranged from 15% to 28%. Adequate—227 replies—ranged from 42% to 58%.

(3) *Willing to stay in service*: 214 replied yes; 236 no.

The Council will continue to send out questionnaires to physicians as they return to civilian life.

DEATHS

SOPHIA BOATWRIGHT BRUNSON

Dr. Sophia Brunson, 88, died at her home in Sumter on March 10.

Born in Louisiana, Dr. Brunson was reared at Ridge Spring and received her education at private schools and the Ohio State Medical College. She was a pioneer woman physician of the south and had practiced her profession for more than fifty years.

Dr. Brunson is survived by one daughter, Miss Sophia Boatwright Brunson of Sumter. Her husband was the former Dr. John A. Brunson, a Baptist Missionary.

THEODORE M. SCHARLOCK

Dr. T. N. Scharlock, seventy-seven year old Charleston physician, died at a hospital in Charleston, on March 15.

Dr. Scharlock was graduated from the Medical College in Charleston in 1897. He was physician at the city jail for more than thirty years and was an authority on bird and poultry breeding. He was also an ardent stamp collector, having served as the first President of the Philatelic Club.

Survivors include one daughter and two sons.

NEWS ITEMS

Dr. J. R. Young of Anderson was installed as President of the Southeastern Surgical Congress at its recent meeting in Louisville. The Congress represents surgeons from twelve states in the southeast.

Dr. Abner Harris Levkoff has returned to Charleston after serving two years in the U. S. Army.

Dr. B. J. Workman, Jr., who has recently completed his tour of duty with the U. S. Navy, has returned to Woodruff and will practice medicine with his father, Dr. B. J. Workman, Sr.

Dr. J. A. Johnson, formerly of Marion, has moved to Anderson and is associated with Dr. W. B. McWhorter.

Dr. Henry L. Baker has been chosen as "Citizen of the Year" by the Civitan Club of Hemingway.

Dr. F. B. Hines of Hartsville has been named as a member of the Darlington County Board of Health.

Dr. Drayton L. Nance, Jr. is practicing in Denmark after recently being released from the U. S. Air Force. He is originally from Newberry.

Dr. Lawrence P. Thackston, President of the S. C. Medical Association, was a speaker at the April meeting of the Greenville County Medical Association.

Dr. Charles F. Timmons of Lake City attended the annual meeting of the American Academy of General Practice which was held this year in St. Louis.

Dr. O. T. Finklea of Florence attended the meeting of the Southeastern Urological Association held this year in Havana.

Dr. James G. Halford, Jr. has opened offices in Anderson for the general practice of medicine. He practiced in Ridge Spring before serving with the U. S. Air Force.

The Department of Otolaryngology, University of Illinois College of Medicine, announces its Annual Assembly in Otolaryngology, divided into sections:

A. Basic Section, September 21 through 26, 1953, devoted to surgical anatomy and cadaver dissection of the head and neck, and histopathology of the ear, nose, and throat, under the direction of Dr. M. F. Snuitman.

B. Clinical Section, September 28 through October 3, 1953, consisting of lectures and panel discussions, with group participation of otolaryngological problems and current trends in medical and surgical management.

Registration will be limited. Application for attendance at one or both sections will be optional. For information write to the Department of Otolaryngology, University of Illinois College of Medicine, 1853 West Polk Street, Chicago 12, Illinois.

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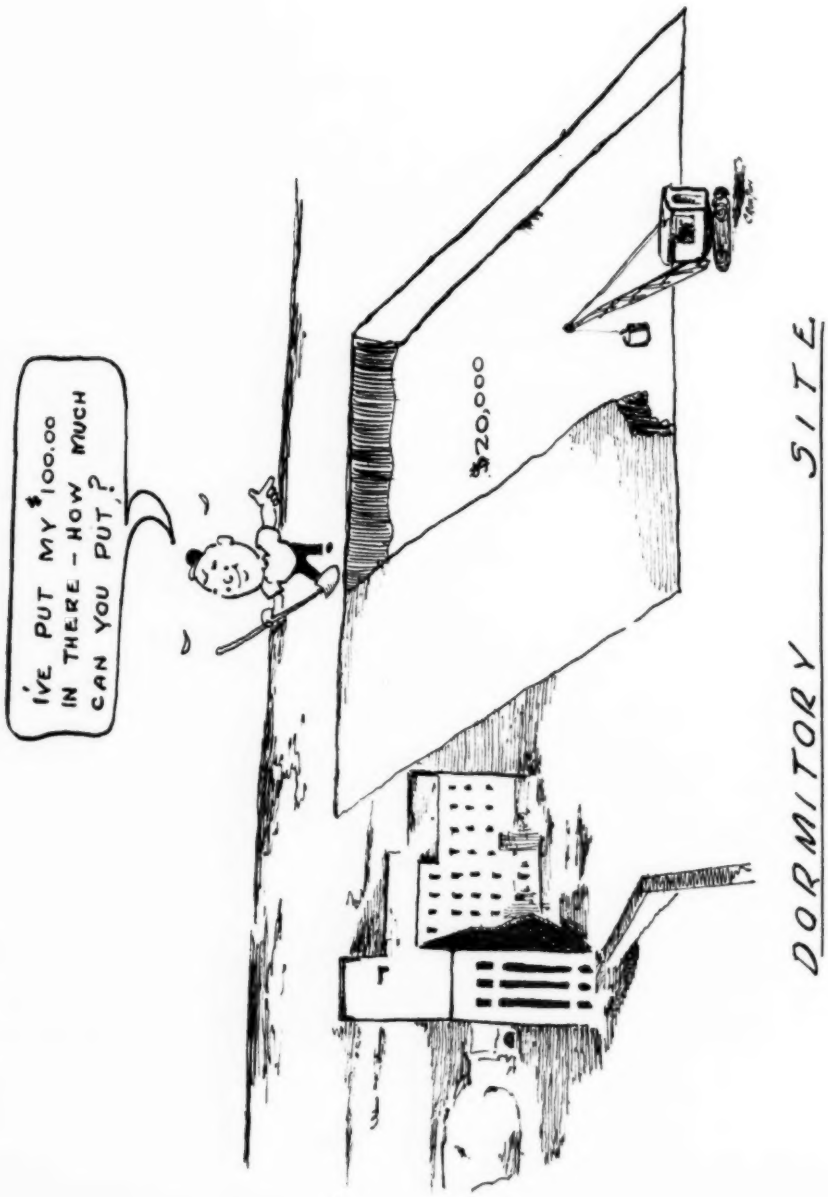
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WOMAN'S AUXILIARY
SOUTH CAROLINA MEDICAL ASSOCIATION

President: Mrs. W. O. Whetsell, Orangeburg, S. C. Publicity Secretary: Mrs. N. D. Ellis, Florence, S. C.

Columbia doctors and their wives were the guests at a recent dinner dance at Pinewood Club given the doctors by the Woman's Auxiliary to the Columbia Medical Society in celebration of Doctors' Day. Over 130 guests were present to honor in particular the past presidents of the Medical Society. The past presidents who attended were Dr. and Mrs. W. J. Bristow, Dr. and Mrs. Ben Miller, Dr. and Mrs. C. J. Milling, Dr. and Mrs. A. T. Moore, Dr. and Mrs. O. B. Mayer, Dr. and Mrs. J. R. Allison, Dr. and Mrs. T. M. DuBose, Dr. William Boyd, Dr. and Mrs. George McCutchen, and Dr. and Mrs. William Weston, Jr. Other past presidents are, Dr. J. H. Gibbes, Dr. J. S. Fouche, Dr. E. W. Barron, Dr. M. H. Wyman, Dr. W. T. Beckman. Dr. F. E. Zemp, Dr. R. B. Durham, Dr. A. F. Burnside, Dr. C K. Lindler, Dr. C. H. Epting, Dr. L. E. Madden, and Dr. C. L. Kibler.

The red carnation is the official flower for Doctors' Day and the hostesses for the evening were dressed in white blouses and red dirndl skirts, and similar colors were used to decorate the club house. Those who served were Mrs. Rudolph Farmer, Mrs. W. S. Hall, Mrs. K. M. Lippert, Mrs. G. W. Scurry, Mrs. J. G. Seastrunk, Mrs. J. F. Hall, Mrs. George Smith, Mrs. G. W. Brunson, Mrs. E. C. Kinder, Mrs. W. C. Cantey, Mrs. George McCutchen, and Mrs. Weston Cook.

Dr. W. A. Boyd gave an interesting talk following the dinner and later both round and square dancing were enjoyed. During intermission Dr. Bothwell Graham played several numbers on the accordian and group singing was led by Dr. C. J. Milling and Dr. R. W. Ball, which they accompanied with the guitar and the mandolin. Prizes for the best costumes were awarded Dr. and Mrs. K. D. Shealy and Dr. and Mrs. E. C. Kinder. Among the numerous other door and dance prizes given was one awarded Dr. and Mrs. W. C. Cantey for the polka.

Mrs. Weston Cook is president of the auxiliary and Mrs. W. C. Cantey was general chairman of the affair. Assisting them was the following committee; Dr. Tucker Weston, master of ceremonies, Mrs. Henry Hall, Mrs. G. W. Smith, Mrs. G. W. Scurry, Mrs. Gordon Seastrunk, Mrs. R. L. Sanders, Mrs. R. F. Haines, Mrs. M. L. Hutchinson, Mrs. E. W. Masters, Mrs. E. C. Kinder, Mrs. R. B. McNulty, and Mrs. W. P. Beckman.

THE TEN POINT PROGRAM

M. L. MEADORS, EXECUTIVE SECRETARY AND COUNSEL

BLUE SHIELD
PROBLEMS IN PROCESSING REPORTS

In this article some problems and the method of handling them will be discussed. They are from reports of physicians in our files. Incidentally, in February approximately 1500 reports were received and processed.

D and C (Code Nos. 1559, 1560 and 1561). Thirty-five dollars is paid for curettement done in connection with pregnancy - abortion, mole, incomplete abortion, providing that careful history indicates that pregnancy presumably occurred after the effective date of the subscriber's agreement. However, only $25.00 is paid for curettement for other causes—functional hemorrhage, diagnostic, and then only when it is an independent procedure and not coinicdental with or to some other surgery (Code No. 1561). Since there is a difference of $10.00 in the fee allowed, it is important that the Participating Physician state his final diagnosis correctly and give the applicable code number. Should he operate under a preoperative diagnosis of functional hemorrhage or for diagnosis, and find a mole of tophoblastic tissue, the post-operative diagnosis applies in determining the fee. When, as has happened several times, no clue is offered as to why the curettement was done, the lesser fee is assigned.

Concussion of the brain is frequently reported, at times singly, but usually in association with other injuries. Concussion may be fleeting, as in the case of a lad knocked momentarily unconscious with a baseball bat reported recently, or it may be deep, prolonged and associated with contusions and laceration of brain tissue. Earlier no fee, other than medical fees for those subscribers with medical coverage, was allowed for concussion. More recently, the Board assigned Code No. 1873 to concussion and fixed a sliding fee of $5.00—$50.00. Obviously, the claims department cannot assign a fee without more information than a diagnosis of concussion. In order to keep the report form as simple as possible, no new questions regarding concussion were incorporated on the reverse of the first sheet of the report. However, there already was space for "comments." It would be a simple matter to briefly state the duration and depth of unconsciousness caused by the concussion. If it was fleeting and coincident to other injuries and required no special treatment, there is no reason to report it in the diagnosis and no extra fee is warranted. If it is prolonged and deep and requires frequent and prolonged observation, the maximum fee is more than earned. In practice, where there is no description of the condition other than the diagnosis, and the "Regular Fee" for the entire care seems to be excessive for the care of the other injuries treated, a letter is usually written asking for more information concerning the concussion. If no regular fee is stated, then the fees are set for the other injuries and the

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concussion is either assigned a minimum fee or no fee at all. The letter requesting more information is written to try to prevent the assigning of an unfair fee to the physician, and to prevent an injustice to the subscriber—and not as some of our friends seem to think, to be meddlesome or pestiferous.

A diagnosis of shock has some of the same indefiniteness as that of concussion. All injuries are accompanied by a greater or lesser degree of shock. In serious injuries, its treatment is a part of the general treatment. Therefore, it has no code number and no fee. However, shock may be a major condition, and give more concern and require more treatment than the actual trauma. Furthermore, in first aid treatment, before transporting the patient to a egional hospital and placing him under the care of specialists, the combatting of shock may be a major and life-saving measure. The claims department is alert to these features of shock, and if the doctor feels that he deserves extra remuneration for his shock therapy, a brief note mentioning the seriousness of the condition and his treatment for its relief will receive sympathetic attention. However, without such statement, the diagnosis will rate no increase in fee. If the regular fee stated seems out of line with that allowed for the injuries treated, a letter will be written to learn more about the condition of shock and the special treatment given because of it—again that both physician and subscriber may be treated fairly by the Plan.

Recently, there was reported by a surgeon in another state his service rendered a subscriber and his wife, injured in a serious automobile accident. The fees allowed by our schedule were large and were promptly paid. Sometime later, the same injuries to the same people received in the same accident were reported by the hometown surgeon. Something was evidently wrong. Extensive correspondence followed. It ultimately was brought out that the local surgeon had examined the injured upon their return home and had given them some physiotherapy for which an extra fee is not allowed by the Plan. The local surgeon was in error in reporting the services he rendered as the setting of fractures, etc. Instead, he should have reported only his service. Had he done so, he would have saved himself and us much unnecessary correspondence. The reason he gave for the nature of his report was that the subscriber had said that the first surgeon would send in no report. Even had that been the case, he should not have reported service which he did not perform.

A reverse of the above was the case of a surgeon who rendered extensive first aid and failed to state that he had then sent the patient to his community hospital and under the care of his family physician for further treatment. The first man was paid as if he had continued treatment to its termination, and the family physician's claim was disallowed until he had written explaining the part which he had played in the case. As a result, the first man was overpaid and the case was unnecessarily expensive to the Plan.

A subsequent article will deal with other problems which have arisen during the processing of physicians' reports.

J. Decherd Guess, M. D.
Medical Director

CONFERENCE HELD ON RURAL HEALTH

The Committee on Rural Health cooperating with the Council on Rural Health of the American Medical Association arranged a conference of the leaders in Rural Community Life at the Columbia Hotel on April 8th. Mr. Aubrey D. Gates, Field Representative for the AMA's Council. who lives in Little Rock, Arkansas, was very active in setting up the plans for the meeting and with the full cooperation of Dr. A. W. Browning, Chairman, and Dr. A. R. Johnston, of the State Committee, worked out what is believed to be a most promising beginning.

Dr. George Bond of Bat Cave, North Carolina, who has won National recognition from organizations and publications outside the medical profession, as well as within, for his work in providing facilities for adequate medical care in rural and undeveloped areas, was present and contributed much to the meeting. Dr. Bond is a new member of the AMA's Council on Rural Health from this section and his interesting personality and ability will undoubtedly be of great value in the future activities of the National organization in this field.

Dr. O. B. Mayer, Chairman of Council, attended the meeting and other officials invited were prevented by conflicting engagements.

Prominent leaders in work in the Rural Life of the State were present. Dr. D. W. Watkins, Director of the Extension Division of Clemson College, Miss Juanita Neeley, State Home Demonstration Agent, and Miss Jane Kitchen, Assistant, of Winthrop College were present.

The conference took the form of a round table discussion and after a few preliminary remarks by Mr. Gates, discussion took off readily on subjects, which in the minds of those representing the farm extension work believed to be the chief problems with respect to medical work in Rural areas.

Principal among these, as was to be expected, were the matter of supply of doctors in the country, the cost of medical care and the availability of satisfactory insurance coverage for the cost of hospitalization and professional fees.

The conference was marked by a wholesome frankness of expression and by a very apparent mutual desire on the part of farm leaders and doctors alike to lay aside any prejudices and dispense with preconceived erroneous impressions and to actually get at the meat of any problems which do exist. While the relationship between the medical profession and these leaders in the Rural Life in South Carolina has always been cordial, everyone present at the meeting seemed to feel that a foundation had been laid for an even closer under-

standing and common effort to dispose of the difficulties which do remain. The meeting began with a luncheon at 1:00 o'clock and immediately thereafter, the discussion began which lasted until nearly five. No effort was made to set up any type of formal organization but it was the concensus of opinion of those present that similar conversations among these and other representatives would be very helpful and these will be planned.

PROPOSED NEW DOCTOR DRAFT LAW ANALYZED

On April 1, 1953 Senator Saltonstall introduced a bill to extend the "Doctor Draft Law" until July 1, 1955. Although sponsored by the Department of Defense, the measure is substantially different from the draft bill originally prepared by that Department. The new bill would reenact the language of the present law, with a few additions. Briefly, the bill would:

(a) Define "active duty" and "active service" to include enlisted or commissioned service since Sept. 16, 1940 with the exception of time spent in a Navy V-12 or Army Specialized Training Program, or periods spent in military internship or residency training or other postgraduate programs.

(b) Give credit for time spent in work of national importance during World War II by conscientious objectors (new provision).

(c) Recognize service between Sept. 16, 1940 and Sept. 2, 1945 in the Armed Services of any country allied with the United States during World War II.

(d) Exclude from liability for further duty physicians with 12 or more months of service since June 25, 1950. This provision, in effect, makes a distinction between service in World War II and service since June 25, 1950.

(e) Authorize the commissioning of non-citizens.

(f) Renew the authority of the national, state and local medical advisory committees to the Selective Service System. This authority is spelled out in greater detail in the bill with respect to residents and faculty members. In view of the stipulation that it would be the *duty* of the advisory committee *to make determinations* with respect to persons in residency training, there is some question as to whether the recommendations of the advisory committees in this area will now be mandatory or whether they will still be advisory.

(g) Authorize the appointment or commissioning of medical officers in grades "commensurate with professional education, experience or ability." This provision is designed to waive current restrictions concerning the number of medical officers eligible for commissions in the higher grades.

(h) Terminate automatically upon completion of 24 months of service the reserve commissions of all physicians taken into the service, by operation of the law.

(i) Continue, until July 1, 1955, the authority of the President to order members of the reserves to active duty with, or without, their consent.

(j) Limit to 17 months the tour of duty of members of the reserves ordered to active duty provided they had 12 or more months of service since Sept. 16, 1940.

The position of the A. M. A., concerning the proposed law was indicated by the following recommendations which the Board of Trustees adopted at its meeting on Feb. 7, 1953:

1. Any proposed legislation should specifically extend the primary obligation of physicians now classified in priorities 1 and 2, who are not called into service before July 1, 1953, the current expiration date of the "Doctor Draft Law."

2. An amendment should be suggested to the basic Selective Service Act which would obligate physicians covered by the basic Act for military service without permitting deferments because of dependency or marital status.

3. The Association should advocate the adoption of legislation which would provide for the recognition of military service since Sept. 1, 1939, with countries which were allies of the United States during World War II for purposes of the "Doctor Draft Law."

4. The present maximum age incorporated in the "Doctor Draft Law" (i. e., registration, age 50; obligation to serve, age 51) should be preserved.

5. The present law should be amended to require registration of physicians, under age 50, who do not have reserve commissions in the Medical Corps of the Army, Navy or Air Force.

6. Physicians who have not served since Sept. 16, 1940, should be called according to age—youngest men first—after physicians currently classified in priorities 1 and 2 have been called up or deferred for reasons of essentiality or physical disability.

7. Physicians with military service since Sept. 16, 1940, should be called according to past service—those with the least amount of service first—after physicians currently classified in priorities 1, 2 and 3 are called up or deferred for reasons of essentiality or physical disability.

8. No distinction should be made between service in World War II and service since June 1950. For purposes of computing total service, military duty either as an enlisted man or officer, with the exception of time spent in a Navy V-12 or an Army Specialized Training Program, should be included.

9. The present concept of deferring physicians regardless of their priority classification if they are essential to the national health, safety or interest should be continued.

10. Legislative authority to establish national and state medical advisory committees to the Selective Service System should be continued.

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11. Any extension of the "Doctor Draft Law" should be limited to one year.

12. In an effort to insure a more equitable utilization of medical manpower by the Armed Services, the Association recommends the establishment of a new position as Assistant Secretary of Defense for Health Affairs. It appears that the proper way to provide for this would be by an amendment to the National Security Act of 1947, as amended. In this connection, it is believed that a continuing concerted effort should be made to effect a lowering of the present ratio of 3.7 physicians per 1,000 troops.

It was also agreed that in the presentation of testimony to the Congress, attention should be called to many inequitable situations currently being created by recalling physicians with prior service to military duty for the same period of time (24 months) as physicians who have never served. It was strongly recommended that a lesser period of service be established for those physicians who had at least 12 months of prior military duty since Sept. 16, 1940.

With respect to the recommendation of the House of Delegates that consideration be given to the establishment of an equitable point system for the call-up of physicians, the Board of Trustees recommended that the matter be investigated further before arriving at a final decision.

9.6 MILLION PERSONS COVERED BY 14,000 PRIVATE RETIREMENT PLANS

Some 9.6 million persons were covered by about 14,000 private retirement plans at the close of 1951, but although about 16 percent of the employed labor force is under some type of pension plan providing protection supplementary to OASI, relatively few private-plan benefits are being paid as yet, since relatively few of the existing employer-sponsored plans were established before 1940.

These points are brought out in the report of the National Planning Association on the two-year study of public and private pension systems conducted for the Joint Senate-House Committee on the Economic Report.

Of the 14,000 private plans, about 90 percent were underwritten by insurance companies, but—about two-thirds of the 9.6 million covered workers were under the 1,000 to 1,500 uninsured-pension trusts. About 55 percent of all the plans used individual-annuity policies sold by insurance companies but these plans were typically small and accounted for only about five percent of the covered workers. Group annuities and certain other types of insured plans accounted for 25 to 30 percent of the coverage. (Insurance Economics Surveys, March 1952)

PERSONAL SAVINGS SHOW NEW GAIN

One of the dynamic forces in the American economy, a factor having a vital bearing on the prospects for continued prosperity and a further rise in living standards, is found in the people's saving record of recent years particularly since Korea. Preliminary figures show that aggregate personal savings in 1952 forged ahead of the high level of the year before to reach the largest annual total ever attained except for abnormal war years 1942 through 1945. At the same time, the past year brought an accelerated growth in the public's "nest egg" in life insurance and other accumulated long-term savings of individuals, so that now the aggregate is approaching the $200 billion mark.

A Tribute to Thrift

Considering the conditions and uncertainties prevalent in recent years, these developments are a remarkable achievement and a tribute to the ingrained thrift habits of the American people. They are the more noteworthy in view of the record tax burden, direct and indirect, borne by the public since the Korean outbreak in June, 1950. The Federal income tax bill alone, to cite one example, is now more than half again as high as it was at the peak of tax collections during World War II.

For the individual and for society as a whole, savings of the present size and wide distribution are of tremendous psychological as well as practical advantage. They symbolize a further extension of both protection and potential purchasing power which increasing millions of Americans have been acquiring over the last decade. Of equal importance, too, from the economic point of view, is the fact that this thrift record provides the assurance of a continued flow of capital funds required for the high investment—high production country that ours has become.

The Challenge Ahead

Now a new challenge lies ahead. Indications are growing that, barring a change for the worse in world conditions, we are heading into an economy less dependent on the outpouring of Government funds for its stimulus and more on the saving and spending decisions of the people, business and the whole private sector of the economy. That is why the financial resources of the public and its thrift institutions are so important, and why the figures give so much ground for encouragement. The U. S. Department of Commerce in a preliminary estimate places the total of personal savings in all forms in 1952 at $19 billions, or approximately 8 cents of every dollar of the people's spendable income after taxes. This total is $2 billions more than aggregate individual savings in 1951 when they were the equivalent of 7.6 cents of the spendable dollar. This record was achieved primarily by the personal choice of millions of people with respect to the use of their incomes and not by any shortage of goods as was the case in the abnormal savings of the last war. By comparison, personal savings in the boom year of 1929 were less than $4 billions and represented only 4½ cents of every dollar of that year's spendable income. (Insurance Economics Surveys, March 1953)